1/16/87 RS650-2

JAPAN · ECONOMIC · INSTITUTE

JEI

REPORT

NO. 1A

January 9, 1987

JAPAN'S DEFENSE INDUSTRY

Summary

Japan's defense industry remains constrained by the twin effects of government budgetary policies and limited production capacity. Although defense production is only a miniscule part of the country's total industrial output, it is a significant element in certain key sectors and therefore important to the overall economy. With Japanese participation in the U.S. Strategic Defense Initiative a likelihood and a decision regarding production of a new fighter support aircraft nearing, the domestic industry will soon have an opportunity to "show its stuff."

This report, the first in a two-part summary of Japan's defense industry, examines the major players; recent production trends; and the interrelation of production and defense policy decisions. The second part, to be published later in the year, will address the effects of policy constraints on the overseas activities of defense contractors.

Market Characteristics

As even casual observers of Japanese defense policies know, the country's total defense spending has been limited since 1976 to an amount equal to 1 percent of the country's gross national product. Economic growth has enabled the defense budget to reach a significant level (see Table 1), but manpower requirements consume nearly half of the Japan Defense Agency's total spending

(45.1 percent of fiscal 1985's budget, for example), reducing the amount available for procurement (see Table 2).

Table 1: Japan's Initial Defense Budget, FY 1955-FY 1987

Fiscal Year	Budget (billion yen)	Percent Change	Budget/GNP Ratio
1955	Y134.9	-3.3%	1.78
1965	301.4	9.6	1.07
1975	1,327.3	21.4	0.84
1980	2,230.2	6.5	0.90
1981	2,400.0	7.6	0.91
1982	2,586.1	7.8	0.93
1983	2,754.2	6.5	0.98
1984	2,934.7	6.6	0.99
1985	3,137.2	6.9	0.99
1986	3,343.6	6.6	0.99
1987 (est.)	3,517.4	5.2	1.00

Source: Japan Defense Agency, Defense of Japan, 1985; Japan Times, December 31, 1986.

Table 2: Allocation of Japan's Defense Expenditures (Initial Budget), FY 1981-FY 1985

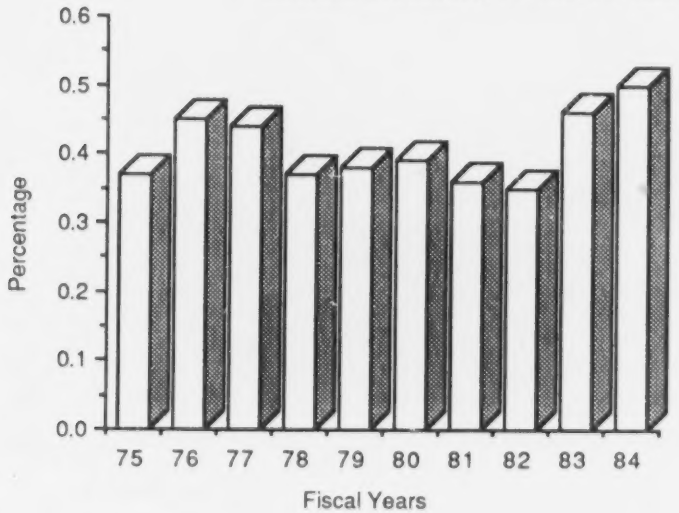
Category	FY 1981	FY 1982	FY 1983	FY 1984	FY 1985
Personnel	47.7%	46.6%	44.5%	44.6%	45.1%
Supplies	52.3	53.4	55.5	55.4	54.9
Equipment acquisition	22.5	22.4	24.9	26.3	26.2
Research and development	1.0	1.1	1.1	1.2	1.6
Facility improvement	2.2	2.3	1.9	1.3	1.4
Maintenance	14.7	15.8	16.3	15.5	15.1
Base countermeasures	10.5	10.4	10.0	9.7	9.5
Other	1.5	1.4	1.3	1.3	1.2
Expenditures (billion yen)	Y2,400.0	Y2,586.1	Y2,754.2	Y2,934.7	Y3,137.2

Source: Japan Defense Agency, Defense of Japan, 1985

The JEI REPORT (ISSN 0744-6489) is published weekly for $40 per year by the Japan Economic Institute of America, 1000 Connecticut Avenue, N.W., Washington, D.C. 20036. Second class postage paid at Washington, D.C. POSTMASTERS: Send address changes to JEI, 1000 Connecticut Avenue, N.W., Washington, D.C. 20036.

This spending cap has limited the growth of the defense market in Japan. Although allocations for equipment procurement have increased in recent years, it is highly unlikely that total defense spending will increase to the level necessary to produce dramatic hikes in equipment budgets, given the serious international and domestic political constraints on Japan's defense policies. Defense production accounts for just 0.5 percent of Japan's total industrial output, although it has been edging upward over the past five years (see Figure 1).

Figure 1: Defense Production as Percent of Total Industrial Production, FY 1975-FY 1984



Source: *Boei Nenkan, 1986*

For individual companies, defense sales are not a significant percentage of total sales, even for major contractors. For example, Japan's largest defense contractor is Mitsubishi Heavy Industries, Ltd., with Y242 billion ($1.1 billion at FY 1985's average exchange rate of Y221.09=$1.00) in contracts in FY 1985. This figure, however, pales in comparison with the company's total sales of Y1,831.6 billion ($8.3 billion). This is in distinct contrast with leading American defense contractors, whose absolute dollar sales in some cases dwarf JDA's total procurement budget and constitute the bulk of the company's total revenues.

However, in certain sectors defense-related activities are critical, particularly in the aerospace industry. In 1985, 83.8 percent of the value of Japanese aircraft production went to the military, known as the Self-Defense Forces. This pattern has fluctuated over the last 10 years, but at no time in recent memory has the percentage fallen below 75 percent. Military production is likely to remain dominant for years to come.

In the boom-and-bust shipbuilding industry, just over 4 percent of total production in terms of value is allocated to defense. The trend has generally been upward over the last decade, leveling off in the last four fiscal years. SDF contracts -- while limited -- are stable and provide an important, steady source of business for Japanese shipyards, which in recent years have been faced with mounting competition from other countries in the civilian sector. At the very least, defense orders serve as a cushion in the leaner years -- an economic role that is likely to continue in the future.

Market Participants

The number of players in the Japanese defense market is limited. Mitsubishi Heavy Industries is by far the most important contractor, accounting for one-fourth to one-third of all defense production over the last several years. The top 10 contractors account for about 80 percent of total outlays (see Table 3). Nevertheless, the number of suppliers to the military is growing for several reasons. One is that much of the research and development

Table 3: Top Japanese Defense Contractors, FY 1984 and FY 1985

(in billions of yen)

FY 1984	Amount
1. Mitsubishi Heavy Industries, Ltd.	Y235.9
2. Kawasaki Heavy Industries, Ltd.	102.7
3. Ishikawajima-Harima Heavy Industries, Ltd.	93.3
4. Mitsubishi Electric Corp.	92.3
5. Toshiba Corp.	60.6
6. NEC Corp.	43.2
7. Japan Steel Works, Ltd.	23.6
8. Sumitomo Heavy Industries, Ltd.	22.1
9. Hitachi Zosen Corp.	20.5
10. C. Itoh Aviation Co., Ltd.	19.5
Total for Top Contractors	713.7

FY 1985	Amount
1. Mitsubishi Heavy Industries, Ltd.	Y242.0
2. Kawasaki Heavy Industries, Ltd.	123.4
3. Mitsubishi Electric Corp.	104.7
4. Toshiba Corp.	73.3
5. Ishikawajima-Harima Heavy Industries, Ltd.	69.4
6. NEC Corp.	40.5
7. Japan Steel Works, Ltd.	28.6
8. Sumitomo Heavy Industries, Ltd.	22.4
9. Hitachi Zosen Corp.	21.6
10. Fuji Heavy Industries, Ltd.	17.7
Total for Top Contractors	743.6

Source: Jieitai Sobi Nenkan, 1985 and 1986.

capability and production capacity are located in the private sector. JDA has its own R&D facility but, as discussed below, its resources are limited. Consequently, the agency tends to look to the private sector for much of the needed know-how and technology, particularly as defense needs have grown more sophisticated and diverse.

That diversification increases the number of companies interested in defense-related work. In areas such as intelligence and surveillance, advanced electronics, for example, plays a critical role. Most of the defense-applicable developments in this field have come from the commercial sector where Japan's prowess is unquestioned. As companies have produced new commercial advances, their military usefulness to JDA has also increased. The nature of defense advances is such that the line between a great many purely commercial and defense products is becoming indistinguishable. The implications of this trend are particularly important, given the limited size of Japan's defense industry. Consequently, the line between defense contractors and private-sector companies is becoming blurred and the number of potential defense contractors is increasing.

Government policy emphasis also influences the number of participants in the market and their respective roles. With self-sufficiency occupying such a high priority in both private-sector and policymaking circles, it makes sense from a policy perspective to diversify the pool and capabilities of potential defense contractors. This is not "industrial policy" in action, but the result is to create an infrastructure of firms that can handle Japan's defense needs.

In aircraft production, Mitsubishi Heavy Industries, Kawasaki Heavy Industries, Ltd. and Fuji Heavy Industries, Ltd. dominate. The mainstays in this sector are F-15 interceptors (MHI is the prime contractor) and P-3C anti-submarine surveillance aricraft (with KHI as the lead contractor). Fuji Heavy Industries plays the primary role in the production of the AH-1S antitank helicopter. Japan Aircraft Manufacturing Co., Ltd. -- a KHI affiliate -- participates in fuselage production. Ishikawajima-Harima Heavy Industries Co., Ltd. dominates the market for jet engines, producing over 70 percent, while KHI and MHI produce the remainder. KHI also is the prime contractor for the T-4 trainer, a domestically developed aircraft.

Five major shipbuilders supply the Maritime Self-Defense Forces: MHI, IHI, Mitsui Shipbuilding and Engineering Co., Ltd., Hitachi Zosen Corp. and Sumitomo Heavy Industries, Ltd. As noted earlier, orders are limited but steady. Licensed production of the U.S. Aegis escort ship offers new opportunities to Japanese manufacturers. Industry surveys suggest that initially, operations will be restricted primarily to basic construction tasks, with a heavy reliance on U.S. electronics and weapons systems. However, the same surveys imply that Japanese companies will try to replace imported components with domestic systems as soon as possible.

An important move with distinct implications for domestic contractors is JDA's decision to introduce Raytheon Co.'s Patriot surface-to-air missile system. MHI will lead the production effort, with Mitsubishi Electric Corp., NEC Corp. and Toshiba Corp. playing important roles. Missile development has been an area of great importance to Japanese manufacturers and the spin-offs in terms of know-how from Patriot production could be sizable.

Research and Development

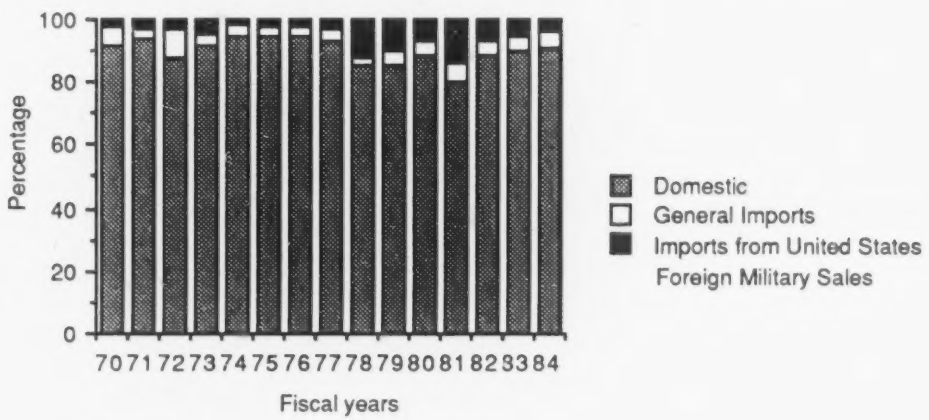
Government-sponsored military R&D is very limited in Japan, but effective given the resources available. JDA's Technical Research and Development Institute is primarily responsible for these activities, but its resources amount to less than 2 percent of the agency's total budget -- Y50.4 billion ($228 million) in FY 1985. (To put this in perspective, the Pentagon's total spending on R&D in FY 1986 will exceed $39 billion, with SDI-related contracts alone accounting for more than $3 billion.) The agency has 970 employees, 530 of whom are actually involved in research. It places the same emphasis on domestic participation as does the general procurement budget. TRDI projects have included the development of the M-79 antitank missile, the F-1 fighter support aircraft, the T-4 trainer and the C-1 jet transport.

Japan is about to embark on a very important project -- the development of a new generation of fighter support aircraft to replace outdated F-1s and perhaps F-4s. The project has been dubbed "FSX" and a decision regarding the plane to be selected is imminent. McDonnell Douglas Corp.'s F-18 appears to be in the running, along with the F-16 made by General Dynamics Corp. (The European Tornado is said to have been eliminated from the competition in the early stages.) Most observers believe, however, that JDA will opt for a plane that can be built largely by domestic contractors, or a U.S.-Japan co-developed plane based on the F-18. The most significant foreign participation will be in supplying engines for the new jet -- still a major limitation in the Japanese aircraft industry.

Domestic Procurement

JDA has emphasized domestic procurement whenever feasible, including licensed production in Japan of foreign -- usually American -- systems. The defense agency spends more than 80 percent of its funds domestically (see Figure 2); the figure is as high as 99 percent in some areas. While most of its

Figure 2: Breakdown of Defense Procurements, FY 1970-FY 1984



Source: *Boei Nenkan, 1986*

"big ticket" purchases are systems developed in the United States, licensed or domestically produced systems are favored over "off-the-shelf" purchases, despite the potential cost advantages of direct purchases from abroad.

The reasons for this emphasis on domestic production vary. For industry, clearly the motive is in part related to profits and guaranteed markets. As business dries up in other sectors, manufacturers are looking to new areas to take up the slack. Defense assures contractors of steady markets in the future. This is particularly true given the predictability of Japan's defense policies. Procurement goals follow the 1976 National Defense Program Outline (see Tables 4 and 5), assuring production stability and long-term markets. Furthermore, national security dictates the necessity to maintain sufficient domestic production capabilities so as to preclude the possibility of being dependent on overseas producers. The defense production committee of Keidanren (the Federation of Economic Organizations -- Japan's most important business organization) has consistently taken this position, and JDA's 1985 white paper also referred to the need for self-sufficiency in defense production.

Another factor concerns the proliferation of defense-applicable products by the commercial sector. As defense systems grow more complicated, commercial suppliers in many high technology fields are finding potential markets for their products in the defense sector. For example, Sony Corp., while known for its "Walkman" and other consumer innovations, is finding the military a potential customer for a variety of products, and not just color televisions.

Patriotism may also factor into the equation. For example, even the generally liberal Asahi Shimbun -- a frequent critic of government defense policies -- reports with a smattering of pride on the steady advance toward domestic production of the FSX. Although it remains a nebulous -- and potentially sensitive -- area, the implications for domestic production cannot go unnoticed.

The final consideration is the United States. Policymakers in the Defense Department are generally reluctant to advertise their views, but there is more than a little support in the Pentagon for a significant defense industry in Japan, in part to supplement U.S. capabilities. Defense Secretary Caspar Weinberger has further endorsed the notion of interoperability of Japanese and American defense systems. Given the established pattern of domestic defense production in Japan, it is logical to conclude that DOD will not object to an expansion of the country's defense production base.

There have been frequent charges that defense production is little more than a means for Japan to develop certain industries that ultimately will compete with their American counterparts, particularly in commercial aircraft (see JEI Report No. 39A, October 14, 1983). A 1982 study by the U.S. General Accounting Office concluded that the technology transfers from programs such as the co-production of the McDonnell Douglas F-15 significantly enhanced private-sector aircraft production capabilities (see Table 6). American journalists, observing that MHI's MU-300 Diamond business jet is assembled next to the F-15 production line, have not been able to resist suggesting that McDonnell Douglas technology has found a home -- with MHI's help -- in that civilian plane.

Japanese executives and many DOD officials downplay such conclusions. One Japanese corporate official wistfully noted that "perhaps MU-300 sales

Table 4: Force Levels Stipulated by 1976 National Defense Program Outline

Classification	Level Stipulated in NDPO	Achieved FY 1985
Ground Self-Defense Forces		
Authorized personnel	180,000	180,000
Units deployed regionally in peacetime	12 divisions 2 composite brigades	12 divisions 2 composite brigades
Mobile operational units	1 armored division 1 artillery brigade 1 airborne brigade 1 training brigade 1 helicopter brigade	1 armored division 1 artillery brigade 1 airborne brigade 1 training brigade 1 helicopter brigade
Low-altitude surface-to-air missile units	8 anti-aircraft artillery groups	8 anti-aircraft artillery groups
Maritime Self-Defense Forces		
Anti-submarine surface ship units (for mobile operations)	4 escort flotillas	4 escort flotillas
Anti-submarine surface ship units (regional district units)	10 divisions	10 divisions
Submarine units	6 divisions	6 divisions
Minesweeping units	2 flotillas	2 flotillas
Land-based anti-submarine aircraft units	16 squadrons	14 squadrons
Anti-submarine surface ships	60 ships	60 ships
Submarines	16	15
Combat aircraft	220	190
Air Self-Defense Forces		
Aircraft control and warning units	28 groups	28 groups
Interceptor units	10 squadrons	10 squadrons
Support fighter units	3 squadrons	3 squadrons
Air reconnaissance units	1 squadron	1 squadron
Air transport units	3 squadrons	3 squadrons
Early warning units	1 squadron	1 squadron
High altitude surface-to-surface air missile units	6 groups	6 groups
Combat aircraft	430	400

In establishing the force levels above, the Outline makes the following assumptions about the international situation and the necessity for a self-defense program:

- The major power blocs will continue a dialogue toward improving relations and reducing the threat of nuclear war.
- Despite this trend, regional instability will remain and the international situation will continue to be fluid.
- An equilibrium exists among the United States, China and the Soviet Union in the area around Japan.
- There is little possibility of a full-scale conflict between East and West due to the military balance, including the nuclear balance.
- While the possibility of regional conflict cannot be dismissed, the U.S.-Japan security arrangement helps maintain international stability and prevents full-scale aggression against Japan.

Source: Japan Defense Agency, Defense of Japan, 1985

Table 5: Weapons Procurement Plan, FY 1986-FY 1990

	Total End of FY 1985	Procure FY 1986-FY 1990	Retire FY 1986-FY 1990	Total End of FY 1990
Ground Self-Defense Forces				
Main battle tanks	1,146	246	187	1,205
Heavy guns	2,161	277	231	2,207
Armored personnel carriers	639	310	---	949
Surface-to-surface missiles	---	54	---	54
AH-1S helicopters	32	43	1	74
CH-47J helicopters	5	24	---	29
Hawk missiles (Type one)	4.5	---	0.5	4
Hawk missiles (Type two)	---	4.5	---	4.5
Maritime Self-Defense Forces				
Destroyer frigates	58	9	5	62
Submarines	14	5	3	16
Other vessels	97	21	25	93
Total vessels	169	35	33	171
P-3C ASW aircraft	49	50	5	94
ASW helicopters	64	66	29	102
MH-53E minesweeping helicopters	---	12	---	12
Other tactical aircraft	31	---	25	6
Tactical aircraft (total)	145	128	59	214
Air Self-Defense Forces				
F-15J/DJ fighters	115	63	15	163
CH-47J helicopters	2	12	---	14
E-2C AEW aircraft	8	5	1	12
Other tactical aircraft	239	---	27	212
Total tactical aircraft	372	87	44	415
T-4 trainer	---	93	---	93
Patriot missile group	0.5	5.0	---	5.5

Source: Japan Defense Agency, Defense of Japan, 1985

Table 6: Examples of U.S.-Japan Defense Co-production

U.S. Company	Japanese Company	Component/System	Dates of Validity
McDonnell Douglas Corp.	Daicel Chemical Industries, Ltd.	F-15 aircraft assemblies	10/79-09/94
Goodyear Aerospace Corp.	Mitsubishi Precision Co., Ltd.	F-15J simulators	08/79-08/94
Bendix Corp.	Ishikawajima-Harima Heavy Industries Co., Ltd.	T-56 engine parts; P-3C aircraft	08/79-08/89
TRW Inc.	Ishikawajima-Harima Heavy Industries Co., Ltd.	F-15 electromechanical parts	07/79-07/94
Texas Instruments Inc.	Mitsubishi Electric Corp.	Magnetic detecting systems	06/79-06/81
Litton Systems Inc.	Toshiba Corp.	AN/ASN-109 (LTN) INS for F-15	05/79-05/89
Teledyne Industries Inc.	Mitsubishi Electric Corp.	AN/APN-217 Doppler navigation set	05/79-05/89
Lear Siegler Inc.	Kanto Aircraft Instrument Co., Ltd.	Automatic flight controls, P-3C	04/79-04/89
General Electric Co.	Toshiba Corp.	F-15 gyro systems	04/79-03/94
Raytheon Co.	Hitachi, Ltd.	DE-1160B sonar	09/79-08/86
IBM Corp.	IBM Japan Ltd.	Data processing/encryption equipment	01/77-12/83
Honeywell Inc.	Japan Aviation Electronics Industry, Ltd.	HDC-301 computers	08/78-08/88

Source: U.S. General Accounting Office, U.S. Military Coproduction Programs Assist Japan In Developing Its Civil Aircraft Industry, March 18, 1982.

would have been better" if potential buyers mistakenly believed it incorporated F-15 technology. Addressing the technology transfer issue in the context of the SDI debate, Nathan Glazer of American University recently suggested that such flows are an inevitable part of the process, adding that individual companies should take appropriate measures to protect the most vital aspects of their systems and assure reciprocity in technology flows. A DOD official concurs, belittling corporate naivete. "We're all big boys and girls," he concludes.

In any case, a 1984 Defense Science Board report noted the pattern of national production and the likelihood that it will continue. It declared that a thorough understanding of Japan's drive for technological self-sufficiency, particularly in defense, is essential for American policymakers and contractors to achieve realistic technology exchanges with Japan. The report underscored the Japanese government's role in high technology, its drive to develop self-sufficiency in defense production and the perceived link between commercial and defense projects.

Japanese R&D efforts also have accelerated in anticipation of restricted access to U.S. technology in the future. Despite its miniscule budget, JDA's Technical Research and Development Institute is attempting to expand its research pool to enable the government and private sector to approach potential U.S. partners on an equitable basis, offering technology swaps when necessary instead of simply seeking licenses of valued U.S. systems for production in Japan.

The self-sufficiency drive is beginning to pay off. The SSM-1 surface-to-surface missile essentially is a home-grown product, developed far more quickly and cheaply than comparable foreign systems. Japanese contractors are making significant advances in communications, remotely piloted vehicles, avionics and other electronics systems. The new modern tanks -- domestic products again -- are considered at least as reliable as comparable U.S. vehicles (although somewhat dated in certain respects). Even the high cost of producing F-15s under license -- about $65 million each, or twice the U.S. price -- is justified by their longer effective lives and lower maintenance costs. Indeed, industry surveys claim that efficiency improvements in the F-15 production process have been sufficient to bring the cost of the plane in line with the U.S. version. Furthermore, savings are claimed in maintenance through both the existence of a strong domestic capability and the higher operating rates of the Japanese planes.

The FSX project clearly is Japan's most ambitious attempt at 100 percent domestic production of a major defense system. While it is unlikely that Japanese industry is independently capable of producing a top-flight alternative to the F-18, its drive toward that goal is demonstrated by the FSX program. The significant consideration is that government and industry have acquired sufficient experience and know-how to seriously explore that possibility.

The FSX program has been highly controversial from the start. Many Japanese and overseas observers have suggested that performance requirements for the new jet were intentionally designed to favor the domestic production option, with MHI playing a major lobbying role. The costs of the program are difficult to estimate, but will be more than $1 billion. (In comparison, JDA's R&D unit spent $289 million on airframe and engine development for the T-4

trainer over the FY 1980-FY 1982 period.) The costs are such that a major increase in Japan's defense budget may be needed if more fundamental programs -- include sustainability -- are not to be neglected.

Nevertheless, Japanese aircraft manufacturers clearly expect to concentrate on the FSX for the foreseeable future. Some Japanese industrialists felt they shortchanged their companies by opting for co-production of imported systems for certain major projects -- particularly the P-3C aircraft -- and they do not want to miss what they see as a major opportunity to give the industry a boost -- perhaps the boost necessary to become competitive with overseas manufacturers.

Future Trends

Many private-sector interests view SDI participation as a way to retain their access to critical technological improvements and perhaps assess their own capabilities. (The implications of participation in SDI will be examined in the second part of this report.)

Beyond SDI, the trends in the Japanese defense industry in part can be predicted by examining the missions of the Self-Defense Forces' three branches. For example, the surveillance needs dictated by the goal to extend protection to the sealanes approaching Japan to a distance of 1,000 nautical miles coupled with a Japanese penchant for technology make it likely that a decision will be forthcoming in the near future on advanced airborne surveillance systems. The P-3Cs, while generally regarded as reliable surveillance aircraft, have significant duration and range limitations, making the aircraft extremely vulnerable.

Given this combination of elements, it is likely that defense officials will consider seriously the introduction of sophisticated airborne warning and command systems (AWACS) instead of simply increasing the number of P-3Cs. Britain's recent decision to purchase Boeing Co.'s AWACS could influence the course of policy and procurement considerations in Japan. Furthermore, given the emphasis on domestic production and the desire to wean Tokyo from U.S. "black box" dependency, the decisions regarding the AWACS and its ultimate successor could mirror many of the elements of the FSX debate.

The policy of the Nakasone government of "meeting a threat at sea" implies increased emphasis on naval units, but this will not necessarily translate into massive boosts in ship construction -- even though naval budgets are slowly increasing relative to the other branches of the SDF. Instead, it tends to support already established trends in the surveillance areas, missile production and development of fighter support aircraft. The 1,000-mile sealane goal could impact on the industry in other respects as well, including in-flight refueling capabilities. Other areas of importance include development and introduction of long-range radar systems, such as over-the-horizon radar systems with ranges in excess of 2,000 miles.

Outlook

As indicated by the most recent round of budget discussions in Japan, defense spending is increasing but each advance is limited and often painful.

Breaching the 1 percent barrier is very important symbolically, but its long-term importance remains to be seen. Contrary to initial press reports, achieving a level of spending equal to 1.004 percent of GNP instead of 0.997 does not mean that the floodgates are suddenly open to defense spending. Nevertheless, it does maintain an established trend and it will facilitate future lobbying efforts by defense-related interests.

Direct government contracts will remain limited due to budget and political constraints, not to mention the government's adherence to a policy of procuring only enough equipment to assure the minimum level of defense necessary for the country. As the sophistication of defense and commercial systems grows, however, the de facto number of potential contractors will increase. For this and other reasons, developments in the domestic industry will be worth watching for years to come.

For further information, contact Michael Chinworth.

* * * * * *

The views expressed in this report are those of the author and do not necessarily represent those of the Japan Economic Institute.

Appendix

Defense Spending by Selected Countries
as Percent of Gross Domestic Product, 1971 and 1984

Country	1971 Percent	1971 Rank	1984 Percent	1984 Rank	Percent Change 1971-84
Greece	4.7%	4	7.2%	1	53.8%
United States	7.1	2	6.5	2	-7.6
United Kingdom	4.9	3	5.3	3	8.0
Turkey	4.5	5	4.4	4	-3.1
France	4.0	6	4.1	5	3.2
West Germany	3.4	9	3.3	6	-2.6
Portugal	7.4	1	3.3	7	-56.0
Netherlands	3.4	7	3.2	8	-6.2
Belgium	2.9	10	3.2	9	11.2
Spain	---	--	2.9	10	n.a.
Norway	3.4	8	2.8	11	-16.3
Italy	2.7	11	2.7	12	-0.7
Denmark	2.4	12	2.3	13	-5.0
Canada	2.2	13	2.2	14	-3.1
Luxembourg	0.8	15	1.2	15	50.0
Japan	0.8	14	1.0	16	20.4
Non-U.S. NATO	3.6		3.5		-0.5
Non-U.S. NATO and Japan	3.0		2.8		-6.1
Total NATO	5.5		5.2		-5.0
Total NATO and Japan	5.0		4.6		-8.4

Source: Department of Defense, Report on Allied Contributions to the Common Defense: A Report to United States Congress, March 1986.